# MSDI Hydrography Stewardship: Maintenance and Improvement of the Montana Portion of the National Hydrography Dataset

Montana Land Information Act
Grant Application
FY09

Respectfully submitted to the Montana Land Information Council
by

Montana Natural Resource Information System

A program of the Montana State Library

# APPLICATION FOR GRANT FUNDING

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**3. Date Submitted:** 2/14/2008 **4. Date Received by State:**

**5. Descriptive Title of Applicant's Project:**

MSDI Hydrography Stewardship:
Maintenance and Improvement of the Montana Portion
of the National Hydrography Dataset

# PROJECT NARRATIVE

## 1. Project Goals & Objectives

The National Hydrography Dataset (NHD) is a comprehensive set of spatial data that contains information about surface water features such as lakes, ponds, streams, rivers and springs. In the NHD, surface water features are combined to form "reaches," providing a framework for linking water-related data to a surface water drainage network.

A high resolution, 1:24,000 NHD was developed by the United States Geological Survey (USGS) in 2005-2006. This data is considered the national standard for Hydrography but is not used widely in Montana. The high resolution data offers many advantages over previously available data. However, few Montana users have adopted it because the data model is unfamiliar and the initial dataset is rife with topology and network errors.

The Montana Natural Resource Information System program (NRIS) is the official steward for Montana's Hydrography data at both the federal and state levels. NRIS carries out these responsibilities in consultation with the USGS and the Montana Hydrography Working Group. The MSDI theme stewardship plan for Hydrography outlines five goals which are consistent with the FY2009 Montana Land Information Plan and in specific alignment with MLIA Goal 1 and Objective 1.1.

The USGS and NRIS have provided for an ongoing program of training, outreach, maintenance and distribution of the high resolution NHD. These activities are associated with Goals 1 through 4 of the MSDI theme stewardship plan for Hydrography. We are seeking MLIA funding for Goal 5 of the stewardship plan which addresses our most critical concern, the poor quality of the high resolution NHD. A second year of MLIA funding will allow us to finish our two-year project of reviewing and correcting the high resolution NHD in order to make it more acceptable to Montana users.

## 2. Technical Approach

### *a. Scope of Work*

In the interests of saving the MLIA Grant Committee time and effort, we have summarized theme plan goals 1-4 which are funded by MSL and USGS and have not changed from the detail provided in our FY08 grant application. Goal 5, the subject of this grant application, is addressed in more detail.

1. Coordinate local efforts to improve hydrographic data and provide support to NHD users throughout Montana (Funded by MSL and USGS)
2. Implement a process for accepting changes to a commonly accepted high resolution Hydrography for Montana (Funded by MSL and USGS)
3. Maintain and distribute the best available, most commonly accepted GIS data about Montana's surface water (Funded by MSL and USGS)
4. Implement a seamless method of submitting locally developed data for inclusion in a National Hydrography Dataset (Funded by MSL and USGS)

5. Improve the overall quality of the high-resolution dataset by carrying out comprehensive review and correction of the high-resolution data (Funded by MLIA)
    a) Using the NHD editing tools provided by the USGS, conduct a thorough review of each HUC, fixing obvious topology and network errors until the flow network is intact.
    b) Use the 2005 NAIP imagery, topographic maps and other data sources to verify the correctness of the changes being made.
    c) To the extent possible, confer with others who have knowledge of the surface water features being reviewed.
    d) Submit corrections to the USGS upon completion of each HUC and track the status of each submission until it is ingested into the official version of the data.

### *b. Deliverables*

Deliverables associated with MSDI theme plan goals 1-4:

1. An active Hydrography Working Group
2. A webpage for reporting Hydrography efforts
3. Presentations and trainings for GIS professionals, planners, researchers, policymakers and private sector users
4. A workflow for submitting changes that is satisfactory to Montana users
5. FY 2008 Data Distribution
    a. State plane versions of the data, updated quarterly, available from the Montana Geographic Information Clearinghouse
    b. UTM version of the data, updated weekly, available from the USGS' National Hydrography Viewer.
    c. Metadata registered with relevant GIS portals.
6. FY 2009 Data Distribution
    d. Following the Minnesota stewardship model, an SDE database at NRIS that mirrors the national database.
    e. Interactive website allowing the user to identify HUCS for "clip and ship" geodatabase downloads
    f. Web feature service to support federated access

Deliverables associated with MSDI theme plan goal 5:

1. At least 50 HUCS corrected for topology and network errors in FY 2008
2. Remaining HUCS corrected for topology and network errors in FY 2009

### *c. Acceptance Criteria*

1. The Hydrography Working Group is actively engaged in the stewardship of the high resolution NHD.
2. Technical and accuracy issues are identified and resolved according to the priorities of the Working Group
3. The comprehensive review and correction of the high-resolution NHD progresses according to the planned timeline.

### *d. Timeline of project* See Attachment A: Project Timeline

### *e. Staff roles and responsibilities*

Sibyl Govan is the Principle Investigator for this project and will perform project management, coordination, outreach, website upkeep and technical guidance for the data exchange process. Sibyl has a background in geology and over ten years experience managing government IT projects.

Duane Lund is the GIS specialist assigned to this project and will perform data maintenance, editing, quality assurance and user support. Duane has worked extensively with Montana's NHD. He has a degree in geology and over fifteen years experience as a GIS expert and cartographer at NRIS.

## 3. Geography Affected

The NHD provides a common framework for mapping surface water features across all public and private lands in the United States and all political jurisdictions. Our project area includes the entire state of Montana as well as certain watersheds that overlap Montana's borders as noted below. The NHD is organized by fourth code hydrologic unit codes, or HUCs. Under an agreement with USGS, Montana NRIS is responsible for the 98 HUCS that fall entirely within Montana's borders or cross the Montana boundary, except for 17010104 and 17010105 in the northwest corner of the state.

## 4. Expected Benefits

The primary benefit of Hydrography stewardship is for data consumers to have access to a single, authoritative information product in the form of digital spatial data that faithfully represents Montana's surface water features. This project will significantly improve the ability of GIS users in many fields to perform complex modeling and analysis of Montana's surface water network. This project will have a more far-reaching impact when derived information products are used for decision-making by planners, managers, researchers and policy makers within and outside of Montana.

## 5. On-going commitment and maintenance

NRIS is prepared to fund 200 staff hours annually for stewardship of Hydrography. We anticipate that when this project is finished, the effort to maintain the dataset will settle at around 400 hours per year. The Working Group will continue to seek funding sources to cover the difference between what NRIS can reasonably contribute and what is required to carry out a maintenance program.

## 6a. Detailed Budget

**FY 2008 Budget**

| Category | Applicant Share | MLIA Share | Other Share | Total |
|---|---|---|---|---|
| **a. Personnel** | **7500** | **30000** | **15000** | **52699** |
| **b. Fringe Benefits** | **2250** | **9000** | **4500** | **18068** |
| **c. Travel** | | **5000** | | **5000** |
| **d. Equipment** | **495** | | **330** | **825** |
| **e. Supplies** | **1230** | | **820** | **2050** |
| **g. Other** | **495** | | **330** | **825** |
| **Totals** | **11970** | **44000** | **20980** | **79467** |

**FY 2009 Budget**

| Category | Applicant Share | MLIA Share | Other Share | Total |
|---|---|---|---|---|
| **a. Personnel** | **7500** | **22500** | **7500** | **37500** |
| **b. Fringe Benefits** | **2250** | **6900** | **2250** | **11400** |
| **c. Travel** | | | **3300** | **3300** |
| **d. Equipment** | **495** | | **330** | **825** |
| **e. Supplies** | **1230** | | **820** | **2050** |
| **g. Other** | **495** | | **330** | **825** |
| **Totals** | **11970** | **29400** | **14530** | **55900** |

NRIS funds will be used to fund approximately 200 hours of NRIS personnel per year for project management, communication, website maintenance and administrative support to the Montana Hydrography Working Group. It will also be used for equipment and supplies associated with stewardship.

In FY2008, MLIA funds will be used to fund approximately 800 hours of NRIS personnel for making corrections and performing QA/QC on the high resolution NHD. It will also fund the costs associated with attending NHD stewardship trainings and/or providing training to users. In FY2009, MLIA funds will be used to fund approximately 600 hours for making corrections and performing QA/QC on the high resolution NHD.

### 6b. *Provide a separate budget summary for each participant*

USGS funds committed to the project are budgeted in the column titled "other share" in the tables above.

In state FY 2008 these funds will cover approximately 400 hours of NRIS personnel time for consulting with USGS on the change submission process, working out problems with the editing tools, consulting with other state stewards, and providing training and outreach to Montana NHD users. These funds will also be used for supplies and materials associated with training users.

In state FY2009 these funds will be used to cover approximately 200 hours of NRIS personnel time for consulting with USGS on the change submission process, working out problems with the editing tools, consulting with other state stewards, and providing training and outreach to Montana NHD users. These funds will also be used for travel, supplies and materials associated with training users.

### 7. Statements of support

A letter of support from USGS is forthcoming.

### 8. Renewable Grant Accountability Report

Deliverables associated with MSDI theme plan goals 1-4:

1. An active Hydrography Working Group
   **(Ongoing – Formed but meeting less often than planned)**
2. A webpage for reporting Hydrography efforts
   **(In Progress – Revising for consistency with GIS Coordination Site)**

3. Presentations and trainings for GIS professionals, planners, researchers, policymakers and private sector users
   **(Ongoing – 2 have taken place, 1 planned for April Conference)**
4. A workflow for submitting changes that is satisfactory to Montana users
   **(Incomplete – referred to Upcoming Working Group Meeting)**
5. FY 2008 Data Distribution
   a. State plane versions of the data, updated quarterly, available from the Montana Geographic Information Clearinghouse
      **(Postponed - users referred to USGS Hydrography Viewer)**
   b. UTM version of the data, updated weekly, available from the USGS' National Hydrography Viewer.
      **(Completed)**
   c. Metadata registered with relevant GIS portals.
      **(Ongoing)**
6. FY 2009 Data Distribution
   a. Following the Minnesota stewardship model, an SDE database at NRIS that mirrors the national database
      **(Postponed indefinitely due to USGS backlog)**
   b. Interactive website allowing the user to identify HUCS for "clip and ship" geodatabase downloads
      **(Postponed indefinitely due to USGS backlog)**
   c. Web feature service to support federated access
      **(Planned)**

Deliverables associated with MSDI theme plan goal 5:

1. At least 50 HUCS corrected for topology and network errors in FY 2008
   **(On Target – see note below)**
2. Remaining HUCS corrected for topology and network errors in FY 2009
   **(Planned)**

Goal 5 Status Note:
As of February 14, 2008, NRIS has completed review of 36 HUCS. 28 have been accepted by USGS, however only 2 have been successfully imported into the national database and made available through the National Hydrography Viewer due to a substantial backlog on the USGS side of the process. For a graphic view of our progress, please see the attached status map.

## 9. Authorized Signature

**I hereby certify that the information and all statements in this application are true, complete and accurate to the best of my knowledge and that the project or activity complies with all applicable state, local and federal laws and regulations. I further certify that this project will comply with applicable statutory and regulatory standards. I further certify that I am (we are) authorized to enter into a binding agreement with the Montana Department of Administration to obtain a grant if this application receives approval.**

**Signature:** Sibyl Govan **Date** 2/14/2008

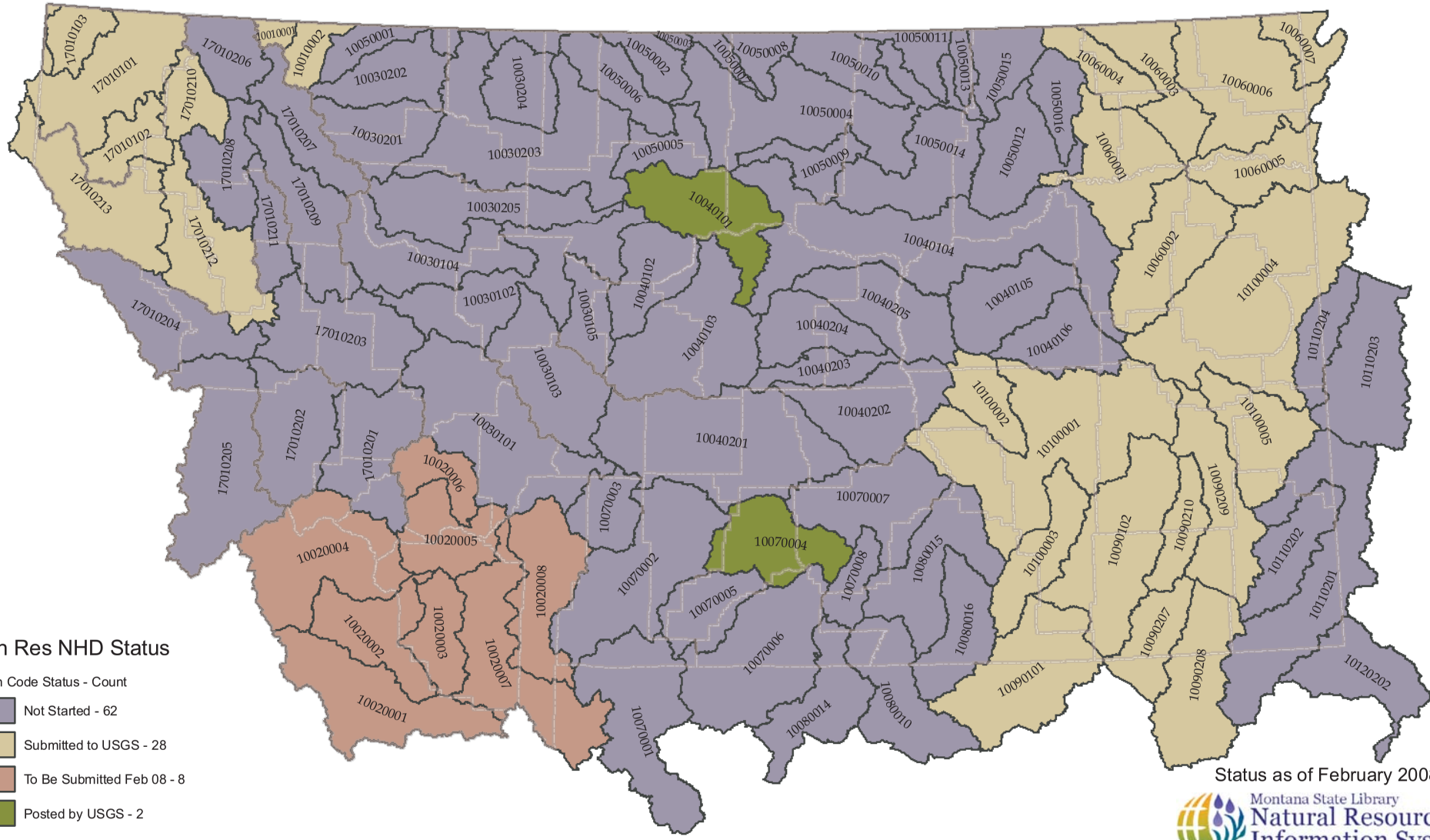
**Sibyl Govan, Digital Library Director and CIO**
**Montana State Library - 1515 E 6th, Helena MT 59620-1800**

# ATTACHMENT A: PROJECT TIMELINE

***The following timeline encompasses stewardship activities that will be or have been carried out under the MSDI Hydrography theme stewardship plan Goal 5 and MLIA funding.***

| | |
|---|---|
| June 1, 2007 | NRIS began quality assurance for high-priority sub-basins as determined by the Working Group. |
| September 30, 2007 | NRIS has completed review of 12 HUCS (complete as of 12/08) |
| December 31, 2007 | NRIS has completed review of 24 HUCS (complete as of 1/08) |
| March 31, 2008 | NRIS has completed review of 36 HUCS (complete as of 2/08) |
| June 30, 2008 | NRIS has completed review of 50 HUCS (in progress) |
| September 30, 2008 | NRIS has completed review of 62 HUCS |
| December 31, 2008 | NRIS has completed review of 74 HUCS |
| March 31, 2009 | NRIS has completed review of 86 HUCS |
| June 30, 2009 | NRIS has completed review of 98 HUCS |

# Montana NHD Stewardship Goal 5: Review & Correction




## High Res NHD Status

Fourth Code Status - Count

- Not Started - 62
- Submitted to USGS - 28
- To Be Submitted Feb 08 - 8
- Posted by USGS - 2

AuthoritativeHUCs0208.mxd

Status as of February 2008

Montana State Library
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